Research Paper | Education | E-ISSN No : 2454-9916 | Volume : 7 | Issue : 2 | Feb 2021

ONLINE COURSE-DESIGN AND PRACTICE OF PHARMACEUTICAL SEPARATION ENGINEERING

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ABSTRACT

Aim: This study aims to introduce a new online teaching design of pharmaceutical separation engineering under the condition of novel coronavirus epidemic how to make full use of the modern information technology to ensure the normal teaching activities according to the notice of Ministry of education and the provincial education department on the postpone the start of school and "stop classes and without stop learning". **Materials and Methods:** the online teaching mode of "rain class + Tencent conference + MOOC" were adopted and discussed. In classroom, the form of teaching design "objective – introduction – concept/principle/knowledge – case / example – application – summary" were adopted. **Results:** On the basis of expanding college students' professional knowledge and disciplinary knowledge, the new online teaching design, can promote students' positive thinking, turn passive learning into active learning, cultivate students' innovation ability and make them form a correct world view and cognition view. **Conclusion:** This method is really student-centered and provides necessary information for teachers to improve the teaching of courses at any time. The paper also provides references for both online course-design practices and future research on the design and practice of "ideological and political elements" in the online teaching of general education courses.

KEY WORDS: Online course-design, pharmaceutical separation engineering, modern information technology, rain class.

INTRODUCTION:

Due to the novel coronavirus epidemic prevention and control needs, according to the notice of Ministry of education and the provincial education department on the postpone the start of school and "stop classes and without stop learning"1-3, online teaching was requested making full use of the modern information technology, for example, rain classroom, wisdom tree, MOOC and other online teaching platforms, combined with QQ, wechat, Tencent conference and other network platforms, a variety of teaching methods were adopted to ensure the normal and orderly teaching activities. Taking the teaching of pharmaceutical separation engineering course as an example, in this paper, the online teaching mode of "rain class + Tencent conference + MOOC" were discussed. At the same time, in order to make full use of the special period and the epidemic situation, combined with the content of the course, the ideological guidance and patriotic education of the young students were introduced to cultivate their morality, build a correct world outlook on life and values, and cultivate the students' indomitable, calm, patriotic and patriotic spirit of struggle and national feelings, educate the students to truly grow up with the motherland and shoulder the historical mission and responsibility, and turn this sudden disaster into precious spiritual resources for revitalizing our motherland4-6. The online teaching design is as follows:

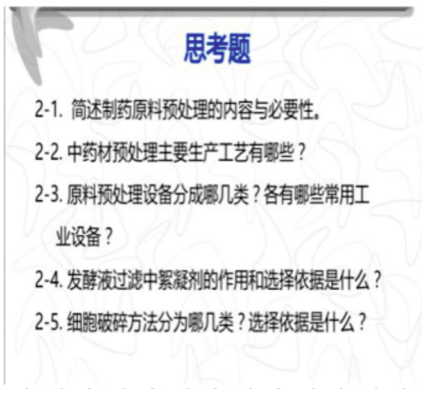
1. Preparation before class:

1.1 Course objective:

This course takes pharmaceutical products as the research object, through the study of this course, students can master the characteristics of pharmaceutical separation technology and the general process of pharmaceutical separation process; acquire knowledge of the function, separation principle and classification of pharmaceutical separation technology, as well as the progress of pharmaceutical separation technology, so that students can make full use of the basic theory, principle and process of the pharmaceutical separation technology involved, combined with the needs of the project, and propose possible design objectives can be put forward based on the reasonable analysis.

1.2 Preview course design:

Preview before class is an important part of teaching activities. Before the class, preview lessons, such as the preview content, teaching objectives and requirements, were sent out to students in advance, to guide students to think about in advance, and some exercises and interaction were designed, so that students can submit online before class, teachers can understand students' preview situation ahead of time, so as to have a definite and clear target in class. At the same time, students are required to express their views and opinions by using the barrage or message in the rain class, so as to promote students' positive thinking, turn passive learning into active learning, and cultivate students' innovation ability.



(a) Design of preview course

(b) Notification of sent to student

Figure 1 diagram of preview course design

(a)

Figure 2 diagram of student visits in rain class

2. Online Teaching:

2.1 Teaching methods:

- heuristic, inspiring and interactive teaching methods were adopted to improve students' ability of active thinking.
- The combination of blackboard writing and multi-media teaching can make the classroom have a large amount of information, the key points is prominent, lively and interesting, which can stimulate students' interest in learning and improve the teaching effect.
- By classroom discussion, the leading roles of students in teaching activities were developed.
- the open thinking questions and exercises after- class, can help students learn to use literature and books to carry out extensive learning, and timely track the latest research trends and engineering progress in construction at home and abroad, so as to stimulate students' active learning potential.

2.2 Teaching modes:

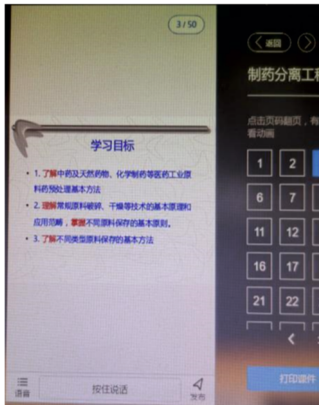
Internet broadcast, rain class + Tencent conference + MOOC platform were adopted in online class. The teacher-student interaction, discussion and other links can be communicated by way of interactive answer and voice live broadcast, instant barrage of the rain classroom, and Tencent conference voice participate in the interaction.

Figure 3 teaching modes

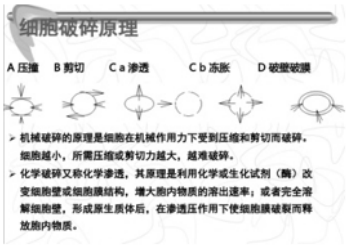
2.3 Design of televised live show of classroom teaching:

In classroom teaching design, the form of "objective–introduction – concept/principle/knowledge – case / example – application – summary" were adopted. In order to avoid network congestion and ensure the teaching effect of live classroom, rain classroom + Tencent conference double platforms were adopted during the online teaching process. In the live broadcast teaching, the student signed in their names by rain class, real -time interaction with students by Tencent meeting, which realize the interactive running simultaneously, such as question answering in real-time, multi-screen interaction, instant barrage and group discussion online. In the lecture, random roll-call is conducted in rain class, while answers questions by Tencent meeting. One hand, it is considered that allowing them to answer questions every few minutes helps to focus the attention of students, on the other hand, it can lead to the following contents what the teacher wants to talk about. In the middle of the class, multiple-choice questions, objective questions or in class tests are sent to consolidate what they have just learned. Finally, in a summary, students were requested to summarize what they have learned in this class to consolidation of knowledge.

(a) Published chapter content



(b) The goal of study



(c) principle

(d) Project case

(e) Classroom Practice

Figure 4 diagram of classroom teaching

3. After class tutoring:

3.1 Homework design:

After class, homework is arranged to send on the network platform. In addition, in order to match the teaching content, the homework will also be expanded to enable students to grasp the course content more firmly and flexibly. Pay attention to every student's answers in real time can realize the teaching goal of guid-

ing students' autonomous learning, inspiring students' thinking, mobilizing learning enthusiasm and focusing on every student's learning effect.

Figure 5 homework design

3.2 statistical analyses after class:

The studies of teaching and student were analyzed according to the feedback data of rain classroom platform after class. By statistical analysis, it can examine the design of self-teaching tasks, the selection of teaching auxiliary materials and videos, actively adjust the key point and difficult points of teaching, improve teaching methods, and then improve and perfect the redesign of course teaching. In addition, the use of rain classroom platform can realize the teaching advantages of face-to-face teaching, multi-dimensional and multi-level after-school test and homework for engineering case sending to students by internet in time, so that students can grasp the course content firmly, realize to the mutual benefit both teaching and learning, and improve the teaching effect.

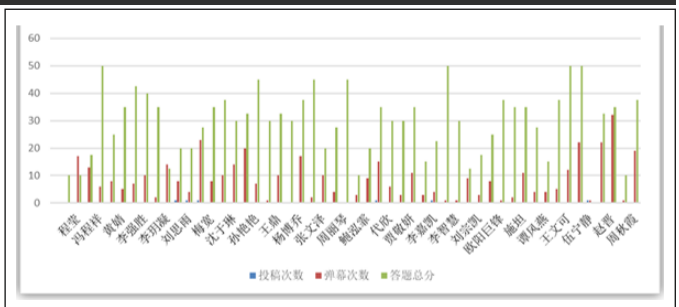


Figure 6 diagram of statistical analysis

3.3 The application evaluation:

The rain classroom only needs to use one mobile phone to study everywhere. In addition, its function covers all aspects of teaching, which can realize the blending learning with offline classroom teaching as the main body and online autonomous learning as the auxiliary. The online learning can make up for the shortage of classroom teaching hours. At the same time, rain class also improves teachers' understanding of the learning effect: in the past, when teachers need to test the teaching effect, they often adopt the way asking some students for questions before class. This way can only understand the learning situation of several students who answered the questions, which is obviously too one-sided. The tests and discussions in the rain class are sent to each student's mobile phone, and the completion time is limited by the teacher. The feedback results can also be learned after the students have completed the task. It is clear that each student's completion status, which students completed well, which students answered wrong, and where the mistakes are. For teachers, the teaching effect is clear in the heart, which provides a good reference for the reform of teaching methods and teaching mode. At the same time, it avoids the phenomenon that only one person answers the questions in the traditional classroom, and other people do not participate in it. It realizes the possibility that everyone involved can takes part in the practice in the class.

4. CONCLUSION

Based on the student-centered teaching mode on line of pharmaceutical separation engineering, it is not only convenient and fast, but also can realize the combination and supplement of online and offline. At the same time, using the advantages of visualization, repeatability and flexibility of online courses, it can be guide students to understand the relationship between theoretical knowledge and practice of pharmaceutical separation engineering. At the same time, the course-feedback of online test, online guidance in study and Question & Answering in the class, online examination can achieve the expected effect through learning, counseling, Q & A, test and course evaluation at the same time and mutually improved each other. As a front-line teacher, this epidemic situation changes the course-design and teaching methods, but we benefited the good teaching effect through our hard work. In the face of the sudden epidemic situation, we hope to pass on our patriotism to the students, and make everyone responsible for the world. Let's unite as one and tide over the difficulties together!

Acknowledgement:

This work was supported by Research funding from the reform in education project in Zhengzhou University and Postgraduate Education Reform and Quality Improvement Project of Henan Province, No. HNYJS2020KC03; YJSXWKC201903; 2019ZZUGSKCSZ030; 2020zzuJXLX043; 2020zzuJXLX035; 2019ZZUJGLX135; 2020ZZUZYCX05

Conflict of Interest: The authors declare no conflict of interest.

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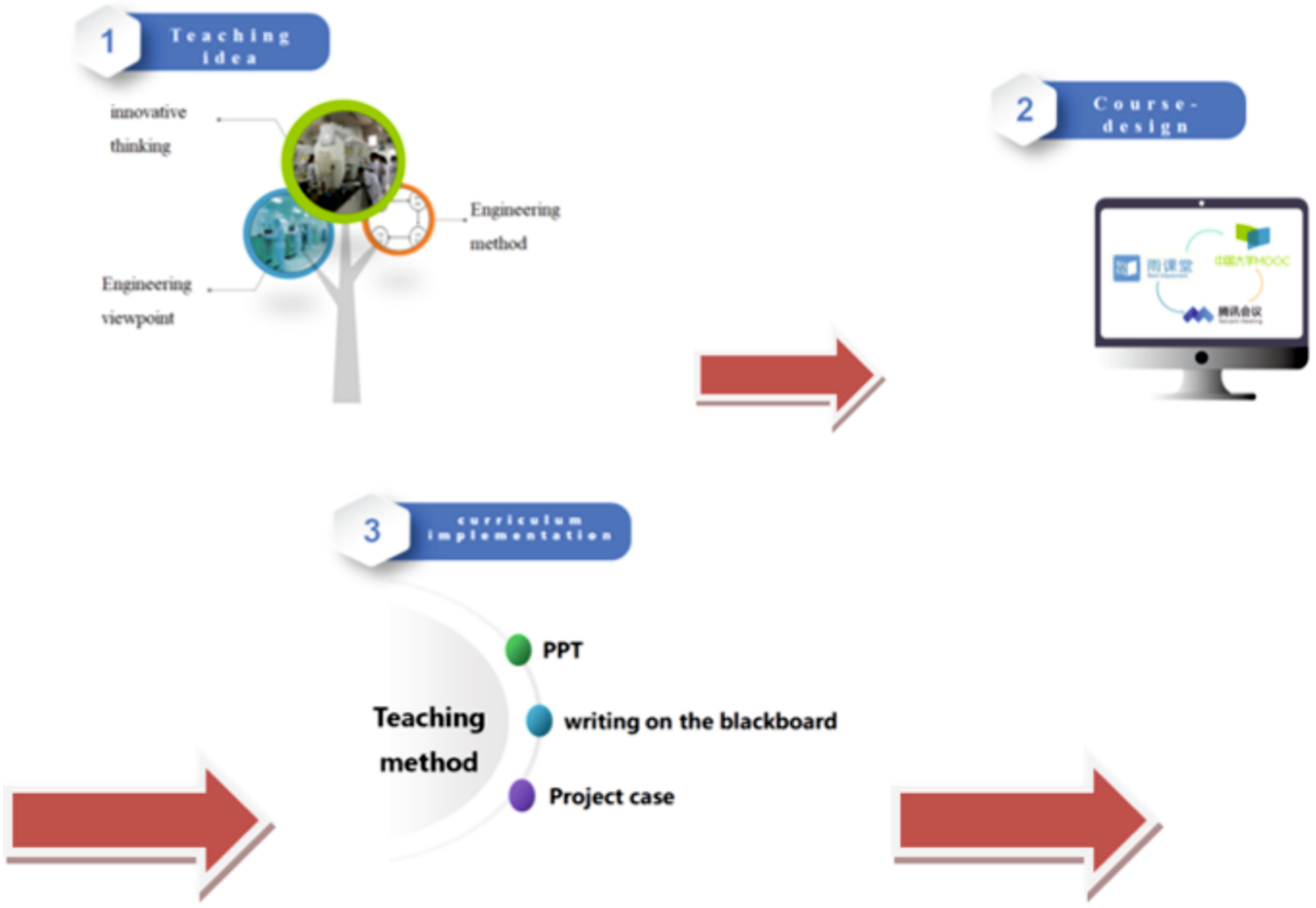
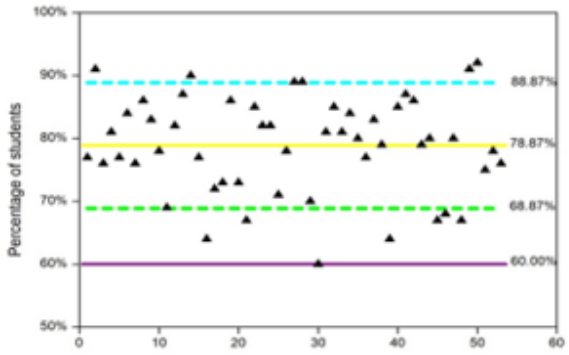
PICTORIAL ABSTRACT



4 result

Data-feedback analysis



Distribution Graph of Achievement Degree of Students' Courses

课程目标达成度	目标1(%)		目标2(%)		目标3(%)		平均值(%)
平均值	79.27%		82.42%		62.18%		80.85%
中间值	82.00%		86.67%		65.00%		77.89%
标准偏差	14.75%		13.68%		23.51%		17.31%
最高达成度	96.00%		100%		100%		98.67%
最低达成度	20.00%		50%		0%		23.33%
达成度分布	人数	比例(%)	人数	比例(%)	人数	比例(%)	总达成度分布(%)
90%及以上	15	26.79%	25	44.64%	8	14.29%	14.55%
80%-89%	21	37.50%	10	17.86%	4	7.14%	36.36%
70%-79%	10	17.86%	10	17.86%	15	26.79%	18.18%
60%-69%	3	5.36%	6	10.71%	8	14.29%	27.27%
60%以下	6	10.71%	4	7.14%	20	35.71%	3.64%
教学及考核方式	期末考试（1题）		期末考试（2题）		期末考试（3题）		平均课程达成度 76.80%

Statistical Analysis of data feedback